Program Library 289

Volume

2200 General Demonstration Package

WANG
Volume 289

2200 Series

2200

General

Demonstration

Package

© Wang Laboratories, Inc., 1973
Warranty Disclaimer and Consequential Damages

The programming staff of Wang Laboratories, Inc. has taken due care to prepare this program package, including research, development, and testing to ascertain its effectiveness. Wang Laboratories, Inc. and its subsidiaries make no expressed or implied warranty of any kind with regard to this program package and its related material. In no event shall Wang Laboratories, Inc. or its subsidiaries be liable for incidental or consequential damages in connection with or arising out of the furnishing, performance or use of any of its programs.

Proprietary Rights

This program package is a company proprietary item. Tape cassettes of programs may not be reproduced without the written consent of Wang Laboratories, Inc.

Payment Address

The fee for a package is to be remitted directly to Wang Laboratories, Inc. at 836 North Street, Tewksbury, Massachusetts 01876. No agent or representative is charged with the authority to accept payment on behalf of the administrative offices of Wang, Laboratories, Inc.
INTRODUCTION

This manual is intended to provide the Wang salesforce with a set of general demonstration programs used in showing customers the variety of 2200 advanced programmable calculator capabilities.

The programs selected include CRT display - oriented "eye-catchers", mathematical programs and business - oriented programs. The last program in this package is a Wang EPA/LEASE agreement preparation program that not only impressively demonstrates the business - oriented capabilities of the 2200 advanced programmable calculator; but, also immediately types the actual document on a Wang EPA/LEASE form for the convenience of the customer.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>TITLE</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Block Program</td>
<td>1</td>
</tr>
<tr>
<td>Marquee</td>
<td>5</td>
</tr>
<tr>
<td>Sine Curve</td>
<td>9</td>
</tr>
<tr>
<td>Race Track</td>
<td>13</td>
</tr>
<tr>
<td>Mean, Variance, Standard Deviation</td>
<td>17</td>
</tr>
<tr>
<td>Linear Regression</td>
<td>21</td>
</tr>
<tr>
<td>Simultaneous Equations</td>
<td>25</td>
</tr>
<tr>
<td>Mortgage</td>
<td>29</td>
</tr>
<tr>
<td>Payroll</td>
<td>33</td>
</tr>
<tr>
<td>Lease vs. Purchase</td>
<td>37</td>
</tr>
<tr>
<td>EPA/Lease</td>
<td>43</td>
</tr>
</tbody>
</table>
PROGRAM ABSTRACT

The "Control" block places 9 programs at the user's finger tips by using the Special Function Keys

<table>
<thead>
<tr>
<th>BLOCK</th>
<th>SAVE &quot;NAME&quot;</th>
<th>BYTES REQUIRED</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>395</td>
</tr>
</tbody>
</table>
PROGRAM DESCRIPTION

The Control Block allows for up to 9 programs to be available to the user at the touch of a key. The program "remembers" where it is and will either "search" forward or backward to load the desired program.

The program requires that the variables I7, I8 and I9 not be used in any of the programs (except the Control program).

It is very important that the position of the tape not be changed except by the program. Should the position of the tape be changed, such as an accidental REWIND, it is necessary that the program be started from the beginning (see Section I of the Operating Instructions).

Any program that is in memory may be re-run by either keying Special Function 25 or by keying the Special Function for that program.
OPERATING INSTRUCTIONS

I. TO LOAD CONTROL BLOCK

1. Place tape into tape cassette unit and key REWIND.

2. Key \text{RESET}

3. Key \text{CLEAR} CR/LF

4. Key \text{LOAD} CR/LF *

II. THE FOLLOWING DEMONSTRATION PROGRAMS ARE NOW AVAILABLE:

<table>
<thead>
<tr>
<th>SPECIAL FUNCTION</th>
<th>PROGRAM</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>Marquee</td>
</tr>
<tr>
<td>17</td>
<td>Sine Curve</td>
</tr>
<tr>
<td>18</td>
<td>Race Track</td>
</tr>
<tr>
<td>19</td>
<td>Mean, Variance, Std. Dev.</td>
</tr>
<tr>
<td>20</td>
<td>Linear Regression</td>
</tr>
<tr>
<td>21</td>
<td>Simultaneous Eqns</td>
</tr>
<tr>
<td>22</td>
<td>Mortgage</td>
</tr>
<tr>
<td>23</td>
<td>Payroll</td>
</tr>
<tr>
<td>24</td>
<td>Lease vs. Purchase</td>
</tr>
<tr>
<td>25</td>
<td>Rerun</td>
</tr>
</tbody>
</table>

*Once the 1st block has been loaded, do not touch the tape unit. Should anything, other than by the program, cause the tape to rewind, you must start the system as described in I.
WANG
2200
SERIES
PROGRAM

MARQUEE

TITLE

PMi.02-2200.02A-00FI-1-0  6/8/73

NUMBER  DATE
2200A-02, 2215, 2216/2217

EQUIPMENT

PROGRAM ABSTRACT
Fills and clears the CRT with an increasing rectangle. The program will use any symbol(s) that you supply.

<table>
<thead>
<tr>
<th>BLOCK</th>
<th>SAVE &quot;NAME&quot;</th>
<th>BYTES REQUIRED</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td></td>
<td>1131</td>
</tr>
</tbody>
</table>

© Wang Laboratories, Inc., 1973
Printed in U.S.A.
PROGRAM DESCRIPTION

This program is an "eye-catcher". It builds an ever increasing rectangle until the CRT (display) is filled, then it will retrace it's steps until the display is clear. The cycle is continuous until [RESET] is keyed.

The upper half of the rectangle is made up of a symbol or set of symbols that is supplied by the user. For easier reading, the symbol or set of symbols must be preceded and followed by a period (or decimal point).
OPERATING INSTRUCTIONS

1. Key \texttt{RESET}
2. Key Special Function \texttt{16}
3. \texttt{INSTRUCTION}
4. Key \_ \texttt{NAME, \_ CR/LF}

5. Program will run until \texttt{RESET} is keyed.

EXAMPLE

Display \texttt{.JERRY.} on the marquee

Type \texttt{.YOUR NAME. CR/LF}

4. Key \_ \texttt{J E R R Y \_ CR/LF}
SINE CURVE

PS.02-2200.00A-00FI-1-0  6/8/73
NUMBER  DATE
2200A-02, 2215, 2216/2217
EQUIPMENT

PROGRAM ABSTRACT This program will plot a Sine Curve starting at some point x. The point x is incremented by a value delta x (Δx). The curve will run until RESET has been keyed. The plot symbol(s) used is an input supplied by the user.

<table>
<thead>
<tr>
<th>BLOCK</th>
<th>SAVE &quot;NAME&quot;</th>
<th>BYTES REQUIRED</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td></td>
<td>659</td>
</tr>
</tbody>
</table>
PROGRAM DESCRIPTION

This program is another "eye-catcher". It plots the Sine Curve. The function is \( y = \sin(x) \), where \( x \) is the initial starting point and then \( x \) is incremented by a value \( \Delta x \). The curve will be displayed continuously until \( \text{RESET} \) is keyed.

The values of \( x \) and \( \Delta x \) are inputs supplied by the user.

The symbols used as the plot element are also a user supplied input.

\( x \) is in radians, to change \( x \) to degrees

Key 3 0 SELECT D CR/LF
OPERATING INSTRUCTIONS

1. Key **RESET**
2. Key Special Function 17
3. **INSTRUCTION**

4. Key x, DELTA x **CR/LF**
5. **INSTRUCTION**

6. Key SYMBOL **CR/LF**
7. Program will run until **RESET** is keyed.

**EXAMPLE**

Plot Sin(x) in increments of Δx using "HI" as a plot symbol.

\[ x = 0 \]
\[ Δx = .2 \]

This program will plot a Sine Curve starting at some point x. The point x is incremented by a Value Delta x. The curve will run until the **RESET** button is keyed. Input x, Delta x.

4. Key 0 , - 2 **CR/LF**

The plot symbol used is an input, controlled by the user. Input the symbol you wish to be used.

6. Key H I **CR/LF**
This page intentionally left blank.
WANG
2200
SERIES
PROGRAM

RACE TRACK

TITLE

PMi.04-2200.02A-00F1-1-0 6/8/73

NUMBER
2200A-02, 2215, 2216/2217

DATE

EQUIPMENT

PROGRAM ABSTRACT

Displays a race between five "horses" and keeps track record, odds and number of wins.

<table>
<thead>
<tr>
<th>BLOCK</th>
<th>SAVE &quot;NAME&quot;</th>
<th>BYTES REQUIRED</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td></td>
<td>1315</td>
</tr>
</tbody>
</table>
PROGRAM DESCRIPTION

This program will display a "horse" race on the CRT. There are five "horses" and their movements are random. The first "horse" to reach the end of the track is the winner. The winner's time and length of lead over the second place "horse" is displayed along with the track record and odds table.

The program requires no user inputs and will run until [RESET] is keyed.
OPERATING INSTRUCTIONS

EXAMPLE
Run a Horse Race

1. Key  RESET

2. Key Special Function 18
This page intentionally left blank.
WANG
2200
SERIES
PROGRAM

MEAN, VARIANCE, STANDARD DEVIATION

TITLE

PS.01-2200.02A-00FI-1-0  6/8/73
NUMBER  DATE
2200A-02, 2215, 2216/2217
EQUIPMENT

PROGRAM ABSTRACT

This program will calculate the Mean, Variance and Standard Deviation for either a population or a sample.

<table>
<thead>
<tr>
<th>BLOCK</th>
<th>SAVE &quot;NAME&quot;</th>
<th>BYTES REQUIRED</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td></td>
<td>919</td>
</tr>
</tbody>
</table>

© Wang Laboratories, Inc., 1973

Printed in U.S.A.
PROGRAM DESCRIPTION

This program will calculate the Mean, Variance, and Standard Deviation of either a population or sample by the following formulae:

LET N = # of items P = 0 for a population and P = 1 for a sample

\[
\text{MEAN} = \left( \frac{\sum_{i=1}^{n} X_i}{N} \right)
\]

\[
\text{VARIANCE} = \left( \frac{\sum_{i=1}^{n} X_i^2 - (\sum_{i=1}^{n} X_i)^2}{N-P} \right)
\]

\[
\text{STANDARD DEVIATION} = \sqrt{\text{VARIANCE}}
\]
OPERATING INSTRUCTIONS

1. Key **RESET**

2. Key Special Function **19**

3. **INSTRUCTION**

   This program will calculate the MEAN, VARIANCE and STANDARD DEVIATION of either a population or sample by the following formulae:

   LET N - # of items and P - 0 for a Population and P - 1 for a Sample

   MEAN - (Sum X)/N

   VARIANCE - ((Sum (X)+2 - (Sum X)+2/N)/{N-P})

   STANDARD DEVIATION = SQR(VARIANCE)

   STOP KEY CONTINUE, CR/LF

4. Key **CONTINUE** | **CR/LF**

5. **INSTRUCTION**

6. Key **0** OR **CR/LF** for Population

   Key **1** | **CR/LF** for Sample

7. **INSTRUCTION**

8. Key **N** | **CR/LF**

   Input 0 for a Population, 1 for a Sample.

   Key **0** | **CR/LF**

   # Of Items (N)

   Key **5** | **CR/LF**

   © Wang Laboratories, Inc., 1973
9. **INSTRUCTION**

10. Key **ITEM 1**  
    CR/LF

   Key **ITEM 2**  
    CR/LF

   :  
   :  

   Key **ITEM N**  
    CR/LF

11. **READ:**

12. **INSTRUCTION**

13. Key 0  
    CR/LF  if you have no more input and go to Step 14

   Key 1  
    CR/LF  if you have more input and go to Step 3.

14. **Program Ends**

**Input Items**

10. Key 1  
    CR/LF

   Key 2  
    CR/LF

   Key 3  
    CR/LF

   Key 4  
    CR/LF

   Key 5  
    CR/LF

**Mean = 3**

**Variance = 2**

**St.Dev. = 1.4142135624**

More Input (1 = Yes, 0 = No)

13. Key 0  
    CR/LF

**END PROGRAM**
LINEAR REGRESSION

TITLE

PS.01-2200.02A-00FI-2-0  6/8/73
NUMBER  2200A-02, 2215, 2216/2217
DATE
EQUIPMENT

PROGRAM ABSTRACT

This program fits the curve $Y=A+Bx$ to a set of $N$ data points by the method of least squares. Also, an analysis of regression is performed.

<table>
<thead>
<tr>
<th>BLOCK</th>
<th>SAVE &quot;NAME&quot;</th>
<th>BYTES REQUIRED</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td></td>
<td>1680</td>
</tr>
</tbody>
</table>

© Wang Laboratories, Inc., 1973
Printed in U.S.A.
PROGRAM DESCRIPTION

This program fits the curve \( y = A + Bx \) to a set of \( N \) data points by the method of least squares. Also, an analysis of regression is performed, the regression table, F-value, coefficient of determination, coefficient of correlation, and standard error of estimate are printed out. The user may estimate values of \( y \) from the regression curve by inputting values of \( x \).

FORMULAE:

\[
A = \frac{\sum y - B \sum x}{N}
\]

\[
B = \frac{N \sum xy - (\sum x)(\sum y)}{N \sum x^2 - (\sum x)^2}
\]

\[
R = \frac{N \sum xy - \sum x \sum y}{\sqrt{(N \sum x^2 - (\sum x)^2)(N \sum y^2 - (\sum y)^2)}}
\]

\( R^2 = \text{Coefficient of Determination} \)

\( R = \text{Coefficient of Correlation} \)

Standard Error of Estimate

\[
\frac{1}{N} \sqrt{\frac{N \sum y^2 - (\sum y)^2 - \left( \frac{N \sum xy - (\sum x)(\sum y)}{N \sum x^2 - (\sum x)^2} \right)^2}{1 - R^2}}
\]

F - Test for \( R \), \( F_R = \frac{R^2(N-2)}{1-R^2} \)
OPERATING INSTRUCTIONS

1. Key  **RESET**

2. Key Special Function **20**

3. **INSTRUCTION**

4. Key No. of (x,y)-Data Points  **CR/LF**

5. **INSTRUCTION**

6. Key X1 , Y1  **CR/LF**
   Key X2 , Y2  **CR/LF**
   .
   .
   Key Xn , Yn  **CR/LF**

EXAMPLE

Fit to the curve \( y = A + Bx \) the following data and perform an analysis of regression.

<table>
<thead>
<tr>
<th>x</th>
<th>y</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

Solve \( y (2.1) \)

This program fits the curve \( y = A + Bx \) to a set of \( N \) data points by the method of least squares. Also, an analysis of regression is performed. The regression table, \( F \)-value, coefficient of determination, coefficient of correlation, and standard error of estimate are printed out. The user may estimate values of \( y \) from the regression curve by inputting values of \( x \). Input the No. of \((x,y)\) - Data Points

4. Key **7**  **CR/LF**

**INPUT 1 (x,y)-DATA POINT/LINE**

6. Key **1 , 2**  **CR/LF**
   Key **2 , 4**  **CR/LF**
   .
   .
   Key **5 , 6**  **CR/LF**

© Wang Laboratories, Inc., 1973
7. READ:
   0 Deg. Coeff. = 1.43093922652
   1 Deg. Coeff. = .7182320441989

8. INSTRUCTION
   STOP KEY CONTINUE, CR/LF TO CONTINUE PROGRAM

9. Key CONTINUE CR/LF

10. READ

REGRESSION TABLE

<table>
<thead>
<tr>
<th>SOURCE</th>
<th>SUM OF SQ.</th>
<th>DEG. FREEDOM</th>
<th>MEAN SQ.</th>
</tr>
</thead>
<tbody>
<tr>
<td>REGRESSION</td>
<td>26. 67719021313</td>
<td>1</td>
<td>26. 67719021313</td>
</tr>
<tr>
<td>RESIDUAL</td>
<td>6. 75138121547</td>
<td>5</td>
<td>1. 350276243094</td>
</tr>
<tr>
<td>TOTAL</td>
<td>33. 4285714286</td>
<td>6</td>
<td></td>
</tr>
</tbody>
</table>

F = 19.7568389058

COEFF. OF DETERMINATION = .798035646656
COEFF. OF CORRELATION = .89332838568
STANDARD ERROR OF ESTIMATE = 1.1628438739

11. INSTRUCTION

12. Key 0 CR/LF if you do not wish to estimate y and go to Step 18.

   Key 1 CR/LF if you do wish to estimate y and go to Step 13.

13. INSTRUCTION

14. Key x CR/LF

15. READ:

16. INSTRUCTION

17. GO TO STEP 12

18. PROGRAM ENDS

   Do you wish to estimate values of y from the Regression Curve?
   (1 = Yes, 0 = No)

   12. Key 1 CR/LF

   INPUT x

14. Key 2 - 1 CR/LF

   y = 2.939226519338

Another Point? (1 = Yes, 0 = No)

END PROGRAM
WANG
2200
SERIES
PROGRAM

SIMULTANEOUS EQUATIONS
TITLE

PS.02-2200.02A-00FI-2-0  6/8/73
NUMBER      DATE
2200A-02, 2215, 2216/2217
EQUIPMENT

PROGRAM ABSTRACT
This program solves a system of N simultaneous equations using a
minimum storage technique. The maximum value of N is 31.

<table>
<thead>
<tr>
<th>BLOCK</th>
<th>SAVE &quot;NAME&quot;</th>
<th>BYTES REQUIRED</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td></td>
<td>3115</td>
</tr>
</tbody>
</table>
PROGRAM DESCRIPTION

This program solves a system of $N$ simultaneous equations using a minimum storage technique. ($N \leq 31$)

The data is manipulated as it is entered and is not stored as inputed.
OPERATING INSTRUCTIONS

1. Key  
   ![RESET](image)

2. Key  
   ![Special Function 21](image)

3. INSTRUCTION

4. Key N  
   ![CR/LF](image)

5. INSTRUCTION

The equations are entered 1 equation per line. The end of an equation is signaled by a CR/LF immediately following a question mark. For example, the equation

$$x_1 + 3x_2 + 4x_3 + 5x_4 - 6x_7 = 8$$

would be entered as follows:

? 1, 3, 4, 5, -6, 8  
   ![CR/LF](image)

?  
   ![CR/LF](image)

NOTE: Elements of the equation are separated by a comma.

NOTE: If N = 31, then only 1 CR/LF is required.

EXAMPLE

Solve the following system:

$$3x_1 + 2x_2 + 4x_3 + x_4 = 5$$

$$2x_1 + 0x_2 + 2x_3 + 5x_4 = 1$$

$$2x_1 + x_2 + 2x_3 + x_4 = 3$$

$$2x_1 + 4x_2 + 3x_3 + 1x_4 = 4$$

This program solves a system of N simultaneous equations using a minimum storage technique. The maximum value of N is 31.

Input N

4. Key 4  
   ![CR/LF](image)

Input 1 equation/line. The end of an equation is signaled by a CR/LF immediately following a?
7. READ

X(1) = 1.42857142857
X(2) = .285714285716
X(3) = .142857142858
X(4) = .4285714285712

END PROGRAM
WANG 2200 SERIES PROGRAM

MORTGAGE

TITLE

PF.05-2200.02A-00FI-1-0 6/8/73

NUMBER DATE
2200A-02, 2215, 2216/2217, 2201 (Optional)

EQUIPMENT

PROGRAM ABSTRACT

This program computes the monthly payment and total interest on a loan. The mortgage table may be displayed or printed.

<table>
<thead>
<tr>
<th>BLOCK</th>
<th>SAVE &quot;NAME&quot;</th>
<th>BYTES REQUIRED</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td></td>
<td>1462</td>
</tr>
</tbody>
</table>

© Wang Laboratories, Inc., 1973

Printed in U.S.A.
PROGRAM DESCRIPTION

This program computes the monthly payment and total interest on a loan by the formulae:

\[
M = \frac{P \times I/1200}{1 - \left(1 + \frac{I}{1200}\right)^{-12N}} - (12 \times N) \\
T = (12 \times N) \times M - P
\]

Where:

- M = Monthly Payment
- T = Total Interest
- P = Principal
- I = Annual Interest Rate (%)
- N = No. of Years

The Mortgage Table may be displayed (CRT) or typed on the 2201. The table is displayed or typed in 12 month increments.
OPERATING INSTRUCTIONS

EXAMPLE

Find monthly payment and total interest on the following loan:

Principal = $18,900
Annual Interest Rate = 7%
No. of Years = 25

This program computes the monthly payment and total interest on a loan by the formulae:

\[
M = \frac{P \times I \times 1200}{1 - \left(1 + \frac{I}{1200}\right)^{-12N}}
\]

\[
T = (12N) \times M - P
\]

Where:

M = Monthly Payment
T = Total Interest
P = Principal
I = Annual Interest Rate (%)
N = No. of Years

STOP KEY CONTINUE, CR/LF TO CONTINUE PROGRAM

PRINCIPAL?

6. Key 1 8 9 0 0 CR/LF

ANNUAL INTEREST RATE (%)

8. Key 7 CR/LF

NO. OF YEARS?
10. Key NO. OF YEARS CR/LF

10. Key 2 5 CR/LF

Monthly Payment = $133.58
Total Interest = $21174

Do you want mortgage table?
(1 = Yes, 0 = No)

13. Key 1 CR/LF

Key 0 CR/LF if you do not want table and program ends.

Key 1 CR/LF if you do want table and go to Step 14.

13. Key 1 CR/LF

Do you want a hard copy of table?
(1 = Yes, 0 = No)

15. Key 0 CR/LF

Key 0 CR/LF if you do not want typed copy and go to Step 16.

*Key 1 CR/LF if you do want typed copy and go to Step 16.

*Typewriter (2201) must be plugged in, connected to CPU and in the AUTO MODE.

16. READ:

<table>
<thead>
<tr>
<th>MONTH</th>
<th>PRINCIPAL OUTSTANDING</th>
<th>INTEREST</th>
<th>PRINCIPAL REPAYMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>18900</td>
<td>110.25</td>
<td>23.33</td>
</tr>
<tr>
<td>2</td>
<td>18876.67</td>
<td>110.11</td>
<td>23.47</td>
</tr>
<tr>
<td>3</td>
<td>18853.2</td>
<td>109.98</td>
<td>23.6</td>
</tr>
<tr>
<td>4</td>
<td>18829.6</td>
<td>109.84</td>
<td>23.74</td>
</tr>
<tr>
<td>5</td>
<td>18805.85</td>
<td>109.7</td>
<td>23.88</td>
</tr>
<tr>
<td>6</td>
<td>18781.98</td>
<td>109.56</td>
<td>24.02</td>
</tr>
<tr>
<td>7</td>
<td>18757.96</td>
<td>109.42</td>
<td>24.16</td>
</tr>
<tr>
<td>8</td>
<td>18733.8</td>
<td>109.28</td>
<td>24.3</td>
</tr>
<tr>
<td>9</td>
<td>18709.5</td>
<td>109.14</td>
<td>24.44</td>
</tr>
<tr>
<td>10</td>
<td>18685.05</td>
<td>109</td>
<td>24.58</td>
</tr>
<tr>
<td>11</td>
<td>18660.48</td>
<td>108.85</td>
<td>24.72</td>
</tr>
<tr>
<td>12</td>
<td>18635.75</td>
<td>108.71</td>
<td>24.87</td>
</tr>
</tbody>
</table>

17. INSTRUCTION

Stop Key CONTINUE, CR/LF
to continue table

The table will be displayed or typed in increments of 12, to have the next 12 displayed or typed Key CONTINUE CR/LF

© Wang Laboratories, Inc., 1973
WANG
2200
SERIES
PROGRAM

PAYROLL

TITLE

PF.14-2200.02A-00FI-1-0  6/8/73
NUMBER  DATE
2200A-02, 2215, 2216/2217
EQUIPMENT

PROGRAM ABSTRACT  This program will calculate the gross and net pay for employees whose deduction information is known.

<table>
<thead>
<tr>
<th>BLOCK</th>
<th>SAVE &quot;NAME&quot;</th>
<th>BYTES REQUIRED</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td></td>
<td>2287</td>
</tr>
</tbody>
</table>
PROGRAM DESCRIPTION

This program will calculate the gross and net pay for employees whose deduction information is known.

The following restraints must be honored:

1. \(1 \leq \text{Employee No.} \leq 50\)
2. \(1.25 \leq \text{Hourly Rate} \leq 10.00\)
3. \(0 \leq \text{Hours Worked} \leq 100\)

NOTE: The type of deductions shown (i.e. pension, health insurance, etc.) vary with each employee number. To demonstrate this effectively, key in different employee numbers each time the program is run.
OPERATING INSTRUCTIONS

1. Key \textbf{RESET}

2. Key Special Function 23

3. INSTRUCTION

4. Key \textbf{EMPLOYEE NO.}, \textbf{HOURLY RATE}
   \textbf{HOURS WORKED} CR/LF

5. READ:

EXAMPLE

Employee #25 is making $5.75/Hr. and he worked 45 Hrs. last week. What is his gross and net pay?

This program will calculate the gross and net pay for employees whose deduction information is known. The following restraints must be honored:

1. $1 < = \text{Employee No.} < = 50$
2. $1.25 < = \text{Hourly Rate} < = 10.00$
3. $0 < = \text{Hours Worked} < = 100$

Input employee No., hourly rate, hours worked.

4. Key 2 5 5 7 5 4 5 CR/LF

Employee Number 25 has 1 exemption.

Gross Pay = 273.13

Less Deductions:

Federal Tax = 36.42
State Tax = 1.82
FICA Tax = 9.90
Net Pay = 224.99

© Wang Laboratories, Inc., 1973
This page intentionally left blank.
LEASE Vs. PURCHASE

TITLE

PMI.05-2200.02A-00FI-1-0  6/8/73
NUMBER
2200A-02, 2215, 2216/2217
DATE
EQUIPMENT

PROGRAM ABSTRACT
Compares a lease with purchase of equipment.

<table>
<thead>
<tr>
<th>BLOCK</th>
<th>SAVE &quot;NAME&quot;</th>
<th>BYTES REQUIRED</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td></td>
<td>3819</td>
</tr>
</tbody>
</table>
PROGRAM DESCRIPTION

This program compares a lease with purchase of equipment, using the Bower-Williamson method of analysis. The equipment is depreciated by the sum-of-the-years digits and the appropriate investment tax credit is taken, for the purchase alternative.
OPERATING INSTRUCTIONS

EXAMPLE

Purchase Price = 60,000
Lessee's Income Tax Rate = 48%
Loan Interest Rate = 4-3/4%
Opportunity Rate = 10%
Monthly Rent = $900
Depreciable Life = 10 Yrs.
Salvage Value (For Tax) = $5,000
Actual Salvage Value = $10,000
Expenses for Making Lease = $1,000
Expense Savings due to
Lease = $3,500
Length of Lease = 8 Yrs.
Length of Rental Period = 6 Yrs.
Investment Tax Credit

1. Key [RESET]

2. Key Special Function 24

3. INSTRUCTION

4. Key [CONTINUE] [CR/LF]

5. INSTRUCTION

6. Key [PURCHASE PRICE] [CR/LF]

7. INSTRUCTION

8. Key [LEESEE'S INCOME TAX RATE] [CR/LF]

9. INSTRUCTION

This program compares a lease with purchase of equipment, using the Bower-Williamson method of analysis. The equipment is depreciated by the sum of the year's digits and the appropriate investment tax credit is taken, for the purchase alternative.

If you are all set, key [CONTINUE].

[CR/LF]

Enter the Purchase Price of the equipment?

6. Key [6 0 0 0 0] [CR/LF]

Enter the Leesee's Income Tax Rate?

8. Key [4 8] [CR/LF]

Enter the Interest Rate on a loan, compounded semi-annually

© Wang Laboratories, Inc., 1973
10. Key **LOAN INTEREST RATE** CR/LF
11. **INSTRUCTION**

12. Key **OPPORTUNITY RATE** CR/LF
13. **INSTRUCTION**

14. Key **MONTHLY RENT** CR/LF
15. **INSTRUCTION**

16. Key **DEPRECIABLE LIFE (In Years)** CR/LF
17. **INSTRUCTION**

18. Key **SALVAGE VALUE (For Tax)** CR/LF
19. **INSTRUCTION**

20. Key **ACUTAL SALVAGE VALUE** CR/LF
21. **INSTRUCTION**

22. Key **LEASE AGREEMENT EXPENSES** CR/LF
23. **INSTRUCTION**

24. Key **LEASE SAVINGS** CR/LF
25. **INSTRUCTION**

26. Key **LENGTH OF LEASE (Years)** CR/LF
27. **INSTRUCTION**

---

10. Key 0 4 7 5 CR/LF

Enter the Opportunity Rate that can be earned, after taxes, on new investments, compounded semi-annually.

12. Key 1 CR/LF

Enter the Monthly rent, payable in advance.

14. Key 9 0 0 CR/LF

Enter the Depreciable Life of the equipment, in years.

16. Key 1 0 CR/LF

Enter the Salvage Value for tax purposes.

18. Key 5 0 0 0 CR/LF

Enter the Expected Actual Salvage Value, must be < purchase price.

20. Key 1 0 0 0 0 CR/LF

Enter the expenses of making the lease agreement.

22. Key 1 0 0 0 CR/LF

Enter the Annual Savings in expenses due to lease.

24. Key 3 5 0 0 CR/LF

Enter the Length of Lease in years.

26. Key 8 CR/LF

Enter the Length of the Rental Period.
28. Key **LENGTH OF RENTAL PERIOD** [CR/LF]

29. **INSTRUCTION**

30. Key 0 [CR/LF] OR Key 1 [CR/LF]

31. **READ:**

28. Key 6 [CR/LF]

Enter 0 if no investment tax credit taken, otherwise enter 1.

30. Key 1 [CR/LF]

Comparison of Lease with Purchase

Purchase Price = $60,000
Interest Rate = 4.7500000E-02
Monthly Rent = $900
Salvage for Tax = $5,000
Expense of Arranging Lease = $1,000
Actual Expense Savings Due to Lease = $3,500
Lease Length = 8 Yrs.
Basic Rental Period = 6 Yrs.
Investment Tax Credit to be taken is = $4,200
Tax Rate = .48
Opportunity Rate = .1
Depreciable Life = 10 Yrs.
Expected Salvage = $10,000

STOP Key CONTINUE, CR/LF to CONTINUE

32. Key CONTINUE [CR/LF]

33. **READ:**

<table>
<thead>
<tr>
<th>YEAR</th>
<th>RENT</th>
<th>DEPRECN INTEREST</th>
<th>LOAN LEASE</th>
<th>LEASE</th>
<th>LEASE</th>
<th>LEASE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10000</td>
<td>10000 2500.00</td>
<td>2500</td>
<td>-2758</td>
<td>-3579</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>10000</td>
<td>90000000 2162.00</td>
<td>3500</td>
<td>1646</td>
<td>1422</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>10000</td>
<td>8000 1715.00</td>
<td>3500</td>
<td>2341</td>
<td>1834</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>10000</td>
<td>7000 442.50</td>
<td>3500</td>
<td>3045</td>
<td>2164</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>10000</td>
<td>6000 757.00</td>
<td>3500</td>
<td>3500</td>
<td>2424</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>10000</td>
<td>5000 243.00</td>
<td>3500</td>
<td>4487</td>
<td>2624</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>10000</td>
<td>4000 0.00</td>
<td>3500</td>
<td>-5716</td>
<td>-3031</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>10000</td>
<td>3000 0.00</td>
<td>-6500</td>
<td>-14276</td>
<td>-6867</td>
<td></td>
</tr>
</tbody>
</table>

Stop Key CONTINUE [CR/LF] to continue

© Wang Laboratories, Inc., 1973
34. Key CONTINUE CR/LF
35. READ:

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial Advantage of Lease</td>
<td>3415.76</td>
</tr>
<tr>
<td>Operating Advantage of Lease</td>
<td>-3009.18</td>
</tr>
<tr>
<td>Net Advantage of Lease</td>
<td>406.58</td>
</tr>
</tbody>
</table>
WANG
2200
SERIES
PROGRAM

EPA/LEASE

TITLE

PMi.05-2200.02A-00F1-2-0  6/8/73
NUMBER  2200A-02, 2215, 2216/2217, 2201
DATE
EQUIPMENT

PROGRAM ABSTRACT  This program will allow 2200 system to be designed by the "buyer" and will show EPA, EPA (with maintenance), 3 or 5 Yr. lease, 3 or 5 Yr. pay off, and educational discount.

<table>
<thead>
<tr>
<th>BLOCK</th>
<th>SAVE &quot;NAME&quot;</th>
<th>BYTES REQUIRED</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

© Wang Laboratories, Inc., 1973
Printed in U.S.A.
PROGRAM DESCRIPTION

This program is designed to have the user create his own system and determine exactly what it will cost him.

The options are:

3 Year Lease
3 Year Full Payout Lease
5 Year Lease
5 Year Full Payout Lease

Outright Purchase:

   With or without maintenance

   Educational discount on any of the above.
OPERATING INSTRUCTIONS

1. Key [RESET] [CLEAR] [CR/LF] [LOAD]
   "EPA" [CR/LF]

2. Key [RUN] [CR/LF]

   Once you decide to use this program it is necessary to set-up the control block before using any of the other programs.

3. INSTRUCTION
4. Key 2 2 0 0 [CR/LF]

5. READ:
   Available Peripherals for Wang 2200 System
   Wang Calculators/Computers/Word Processing Systems
   Line Item No. Description Unit Price

   2200 peripherals will be displayed, 12 items at a time.

6. INSTRUCTION
7. Key [CONTINUE] [CR/LF]
   After all peripherals have been displayed

8. INSTRUCTION
9. Key [CONTINUE] [CR/LF]

10. Read the List of Special Functions available.

© Wang Laboratories, Inc., 1973
11. To Create System Configuration

12. Key Special Function 0

INSTRUCTION

Input Qty. of 99 to Reconfigure
System Configuration Work Sheet
Wang Calculators/Computers/Work Processing Systems
Item No. Description
Unit Price Qty. Amount

The equipment will be displayed 1 item at a time. The program waits for a Qty. to be entered. If that item is not wanted, key CR/LF and the next item will appear.

13. Key QTY. - CR/LF

14. Program will loop until all equipment has been shown. At end read order and cash price.

15. INSTRUCTION

Depress CR/LF to rework system or function key

STOP 0 = Rework System
1/6 = EPA
2-5 = Lease Plans

16. For an EPA (without maintenance)

Key Special Function 1

17. The order is displayed

18. For an EPA/Maintenance

Key Special Function 6

19. For a 3 Year Full Pay

Key Special Function 2

20. For a 5 Year Full Pay

Key Special Function 3

21. For a 3 Year Lease

Key Special Function 4

© Wang Laboratories, Inc., 1973
22. For a 5 Year Lease
   Key Special Function 5

23. For an Educational Discount
   Key Special Function 12

24. To display all Special Function Options
   Key Special Function 13

25. For output on Special Form Paper.
   This is a Wang EPA or Lease Agreement Form and can be used to close the sale right there.

   Note: Recommended that salesman try this ahead of time to be sure of correct placement of the forms in the typewriter.

26. For output on Plain Paper.
   Key Special Function 15